

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>P802908/WO/1</b>	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/006247</b>	International filing date (day/month/year) <b>09.06.2004</b>	Priority date (day/month/year) <b>11.06.2003</b>
International Patent Classification (IPC) or national classification and IPC		
Applicant <b>DAIMLERCHRYSLER AG</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>9</u> sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising: a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>4</u> sheets, as follows: <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input checked="" type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input checked="" type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-12 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1-16 \_\_\_\_\_ received by this Authority on 14.09.2005 with letter
- nos.\* \_\_\_\_\_ received by this Authority on of 12.09.2005
- ☒ the drawings:
- sheets 1/4-4/4 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. IV

Lack of unity of invention

1. ☒ In response to the invitation to restrict or pay additional fees the applicant has:
- ☐ restricted the claims.
  - ☒ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☐ neither restricted the claims nor paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
  - ☒ not complied with for the following reasons:  
  
See Supplemental Box.
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
  - ☐ the parts relating to claims Nos. \_\_\_\_\_

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	<u>1-16</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-16</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-16</u>	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
<b>I. <u>Claim 1</u></b>			
<p>1. US-A-4 760 273 (document D1) describes (see column 4, line 50 to column 6, line 31, and figures 4 to 6) an optical sensor element with a semiconductor substrate (8) containing a photosensitive region, in which charge carriers can be released by irradiation with light, and two doping regions (60, 70) for receiving charge carriers released in the photosensitive region; also containing electrodes (14) insulated against the photosensitive region for creating a field gradient in the photosensitive region, the insulated electrodes (14) being located in grooves (8a) formed in the surface of the substrate. Multiple electrodes are obtained by creating an array of units (see figure 1).</p>			
<p>2. The subject matter of claim 1 differs from the above in that the photosensitive region is located between the two electrodes with their associated doping regions. As indicated by the applicant in the letter of 12 September 2005, this geometry serves to increase the sensitivity of the detector element.</p>			

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

3. The detector according to D1 can have two electrodes if a matrix arrangement is used, as shown in figure 1 of D1. However, the photosensitive region does not lie between the two doping regions, and there is nothing to suggest the use of such an arrangement. Attention is also drawn to the argument put forward by the applicant in the letter of 12 September 2005, which is compelling with respect to the amended claim 1.
4. Claim 1 therefore appears to meet the requirements of PCT Article 33(2) and (3).

**II. Claim 9**

1. EP-A-0 651 448 (document D2) describes (see column 7, lines 19 to 44, and figure 5) an optical sensor element with a semiconductor substrate (4) containing a photosensitive region, in which charge carriers can be released by irradiation with light, and electrodes (9) near the photosensitive region for creating a field gradient in the photosensitive region, the electrodes (9) being located in grooves (8) formed in the surface of the substrate and creating Schottky barriers against the photosensitive region. In D2 the electrodes (9) are made of metal, but the metal is penetrated by the semiconductor material of the substrate layer (4), and the structure is therefore a metal-semiconductor structure.
2. The subject matter of claim 9 differs from the above in that there is an ohmic contact diffused into the surface of the photosensitive region, which serves to

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

eliminate the element of constant light irradiation.

The idea of providing an ohmic contact of this sort is neither known from nor suggested by the prior art.

3. Claim 9 therefore appears to meet the requirements of PCT Article 33(2) and (3).

**III. Claims 2-8 and 10-16**

1. Claims 2 to 8 and 10 to 16 contain all the features of claims 1 and 9 respectively. Since claims 1 and 9 appear to meet the requirements of PCT Article 33(2) and (3), the same is true of claims 2 to 8 and 10 to 16.

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

1. The characterising part of claim 1 includes the second electrode and groove, but this feature is known from document D1 and therefore belongs in the preamble (PCT Rule 6.3(b)(i)).
2. Contrary to the requirements of PCT Rule 5.1(a)(ii), the description does not cite documents D1 and D2 and also fails to give an account of the relevant prior art disclosed therein.

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

**Box IV****Lack of unity of invention**

1. US-A-4 760 273 (document D1) describes (see column 4, line 50 to column 6, line 31, and figures 1 and 4 to 6) an optical sensor element with a semiconductor substrate (8) containing a photosensitive region, in which charge carriers can be released by irradiation with light, and two doping regions (60, 70) for receiving charge carriers released in the photosensitive region; also containing insulated electrodes (14) for creating a field gradient in the photosensitive region, the electrodes (14) being located in grooves (8a) formed in the surface of the substrate.
2. The subject matter of claim 1 differs from the above by virtue of the special technical feature according to which the photosensitive region is located between two insulated electrodes formed in grooves with their associated doping regions.
3. Claim 9 has a special technical feature according to which the electrodes are not insulated against the photosensitive region and there are no doping regions.
4. The special technical feature of claim 1 is not the same as the special technical feature of claim 9, and therefore the application lacks unity of invention (PCT Rule 13.1). The two inventions are defined by



## Supplemental Box

claims 1 to 8, 10 to 14 (when dependent on claim 1), 15 and 16 on the one hand, and claims 9 and 10 to 14 (when dependent on claim 9) on the other.

5. Unity of invention could be established by making claim 9 also specify the geometry according to claim 1, in which the photosensitive region lies between two electrodes with their respective doping regions.